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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/944,593

08/31/2001

Ping Xie

10629-802

1721

26211

7590

02/21/2003

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EXAMINER

FINEMAN, LEE A

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/944,593

Applicant(s)

XIE ET AL.

Examiner

Lee Fineman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 41-47 and 50-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 41-47 and 50-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

This Office Action is in response to an amendment filed 25 November 2002 in paper number 7 in which claims 41, 45, 46, 50, 53, 54, and 58 were amended, claims 48 and 49 were cancelled and claims 59-63 were added. Claims 41-47 and 50-63 are pending.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 46-47, and 50-52 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent 6,052,228. Although the conflicting claims are not identical, they are not patentably distinct from each other because they all recite an optical circulator with beam angle turners, specifically modified Wollaston and Rochon prisms. The method of utilizing the structure of the claim is inherent therein.
2. Claim 53 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent 6,052,228. Claims 1-4 disclose the claimed invention except for the ports. Official notice is taken that it is well known to one of

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ordinary skill in the art at the time the invention was made that optical circulators include ports.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made that the optical circulator of Xie et al. to include four or more ports to allow the light input/output needed for circulation.

3. Claims 46-47 and 50-52 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of U.S. Patent 6,285,499. Although the conflicting claims are not identical, they are not patentably distinct from each other because they all recite an optical circulator with beam angle turners, specifically modified Wollaston and Rochon prisms. The method of utilizing the structure of the claim is inherent therein.

4. Claim 53 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of U.S. Patent 6,285,499. Claims 1-2 disclose the claimed invention except for the ports. Official notice is taken that it is well known to one of ordinary skill in the art at the time the invention was made that optical circulators include ports. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made for the optical circulator of Xie et al. to include four or more ports to allow the light input/output needed for circulation.

5. Claims 41-45, 54-58, and 59-63 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6, 8, 14, and 33 of U.S. Patent 6,049,426. Although the conflicting claims are not identical, they are not patentably distinct from each other because they all recite an optical circulator with a longitudinal axis, ports, beam angle turners, specifically modified Wollaston and Rochon prisms, separated by a complete gap.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 41-47 and 50-63 are rejected under 35 U.S.C. 102(b) as being anticipated by Shirasaki, U.S. Patent 5,982,539.

Regarding claims 41 and 54, Shirasaki discloses a method of tuning a spatial separation providing an optical circulator with a longitudinal axis (fig. 2) with a first and third optical port (101, 102) located at the end of the circulator, a second optical port (104) located at a distal end of the optical circulator from the first optical port along the longitudinal axis, a first beam angle turner (figs. 7C, 7D, 8A, 8B) located along the longitudinal axis between the first optical port and the second optical port, a second beam angle turner (figs. 7C, 7D, 8A, 8B) located along the longitudinal axis distally from the first beam angle turner, and the first beam angle turner and the second beam angle turner separated by a complete gap (figs. 7C, 7D, 8A, 8B). Shirasaki also discloses adjusting a length of the complete gap causing a corresponding adjustment in spatial separation between a first light beam traveling for the first optical port to the second optical port and a second light beam traveling from the second optical port to the third optical port wherein the location of the first light beam and the second light beam define the location of the first optical port and the third optical port in so far as inherently in order to achieve the alignment of the elements they must have been placed and therefore “adjusted” during the assembly thereof.

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Regarding claims 46 and 50, Shirasaki further discloses an optical circulator/nonreciprocal optical device (fig. 2) comprising a first compound beam angle turner (first birefringent wedges, figs. 7C, 7D, 8A, 8B) and a second compound beam angle turner (second birefringent wedges, figs. 7C, 7D, 8A, 8B), wherein both an e-ray and an o-ray of the optical beam propagate through both the first beam angle turner and the second beam angle turner (fig 2, column 10, lines 7-13), and where the polarization rotators are nonreciprocal (107-1, 107-2, column 4, lines 40- 43). The method of utilizing the structure is inherent therein.

Regarding claim 59, Shirasaki further discloses an optical circulator with a longitudinal axis (fig. 2) with a first and third optical port (101, 102) located at the end of the circulator, a second optical port (104) located at a distal end of the optical circulator from the first optical port along the longitudinal axis, a first compound beam angle turner (first birefringent wedges in figs. 7C, 7D, 8A, 8B) located along the longitudinal axis between the first optical port and the second optical port, a second compound beam angle turner (second birefringent wedges in figs. 7C, 7D, 8A, 8B) located along the longitudinal axis distally from the first beam angle turner, and the first beam angle turner and the second beam angle turner separated by a complete gap (figs. 7C, 7D, 8A, 8B). Shirasaki also discloses adjusting a length of the complete gap causing a corresponding adjustment in spatial separation between a first light beam traveling for the first optical port to the second optical port and a second light beam traveling from the second optical port to the third optical port wherein the location of the first light beam and the second light beam define the location of the first optical port and the third optical port in so far as inherently in order to achieve the alignment of the elements they must have been placed and therefore “adjusted” during the assembly thereof.

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Regarding claims 42-43 and 55-56, Shirasaki further discloses the first and second beam angle turner as a pair of birefringent wedges separated by a complete gap (figs. 7C, 7D, 8A, 8B).

Regarding claims 47, 51, and 60-61, Shirasaki further discloses the first and second compound beam angle turner as a pair of birefringent wedges separated by a complete gap (gap between first birefringent wedges or gap between second birefringent wedges in figs. 7D, 8A, 8B).

Regarding claims 44, 52, 57 and 62, Shirasaki is silent as to the whether the optical circulator is polarization mode dispersion free, however it is noted that the path lengths of the polarized beams appear to be equal. In addition, Shirasaki recognizes the condition of polarization mode dispersion in a specific embodiment (figs. 11A-D) and corrects it. Therefore it is the position of the examiner the optical circulator of Shirasaki is polarization mode dispersion free.

Regarding claims 45, 53, 58 and 63, Shirasaki further discloses an optical circulator with four optical ports (fig. 2, 101, 102, 103,104).

Response to Arguments

7. Applicant's arguments filed 25 November 2002 have been fully considered but they are not persuasive.

Applicant argues that Shirasaki fails to disclose a complete gap. The examiner disagrees. Figures 7C, 7D, 8A, 8B clearly show a gap between the first birefringent wedges and the second birefringent wedges. Applicant argues that Shirasaki fails to disclose or suggest that adjusting a length of the gap causes a corresponding adjustment in spatial separation between a first light beam traveling for the first optical port to the second optical port and a second light beam

traveling from the second optical port to the third optical port wherein the location of the first light beam and the second light beam define the location of the first optical port and the third optical port. The examiner disagrees. Shirasaki discloses in column 9, lines 14-18, that while the average direction of the two beams whose polarization plane are different after passing through the two birefringent wedges, is the same as that prior to passing through the birefringent wedges, the split angle is changed by deflection. Therefore, a different sized gap causes a different split angle, which causes a different spatial separation between beams. It is the examiner's position that inherently during manufacture and assembly of the optical circulator of Shirasaki, the first birefringent wedges and the second birefringent wedges are placed and adjusted to achieve alignment of the elements which therefore includes a corresponding adjustment in spatial separation between a first light beam traveling for the first optical port to the second optical port and a second light beam traveling from the second optical port to the third optical port wherein the location of the first light beam and the second light beam define the location of the first optical port and the third optical port.

Applicant further argues that Shirasaki does not disclose wherein both the o-ray and the e-ray pass through both compound beam angle turners. The examiner disagrees. In figures 7C, 7D, 8A, 8B, the "first birefringent wedges" are a compound beam angle turner and the "second birefringent wedges" are a compound beam angle turner (compound is taken by the general meaning "involving or used in combination" from Merriam Webster's Collegiate Dictionary, tenth edition). Therefore, both the o-ray and the e-ray will pass through both compound beam angle turners.

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8. It is noted by the Examiner that the objections to the drawings, specification, and claims made in the previous Office Action have been withdrawn due to amendment by the Applicant.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (703) 305-5414. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the

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- organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



LAF

February 12, 2003


MARK A. ROBINSON
PRIMARY EXAMINER